Descriptive Study of Clinical Profile and Neuro Imaging in Ischemic Stroke Patients

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Abstract: *Background: stroke is leading cause of fatalities and disability in India. The stroke treatments work best if it is recognized and diagnosed within 3 hours of the first symptoms. Computed Tomography (CT scan) of brain available to precisely demarcate the area of cerebral infarction/hemorrhage. However, the advances of neuroimaging techniques not available in every health center of resource limited country like India. Act F.A.S.T concept will help to diagnose stroke where imaging facility not available. Objective: To analyze the risk factors, clinical profile, regional distribution of infarct based on neuroimaging and evaluates the final outcome of the patients. Methodology: A prospective cross sectional study carried out among ischemic stroke patients. Patients were interviewed for their symptoms, demographic data, co-morbidity and personal history of habits. In case of comatose patients, relatives/caretakers were interviewed. All cases were followed till the hospital stay to assess outcomes and mortality. Result: Ischemic stroke more commonly seen in male and patients with >60 years of age. >50% of patients had exposure of tobacco. 84% patients had weakness as a leading symptoms followed by speech disturbance (43%). Proportional mortality ratio was 6%. Conclusion: Majority of patient reported with smoking and alcohol which is modifiable risk factor to prevent stroke. Co-morbidity like hypertension, dislipidemia and diabetes is well known for the stroke need to be well managed in their early stage to prevent stroke. Outcome of patients in present study was quite good, though we need to prevent disease occurrence to decrease burden of disease itself.*

Keywords: Clinical Profile, Neuro Imaging in Ischemic Stroke Patients

1. Introduction

Stroke is a global health problem. It is the second most common cause of death and fourth leading cause of disability worldwide [1]. A stroke is defined as a neurological pathology that lasts for more than 24 hours. [2]

Known risk factors for the stroke are systolic and diastolic hypertension, diabetes, atrial fibrillation, hypercholesterolemia, cigarette smoking, alcohol intake, and oral contraceptive use. [2]

According to ICMR estimates from 2004, stroke was responsible for 41 percent of fatalities and 72 percent of disability adjusted life years among noncommunicable diseases in India [3]. Due to their prolonged hospitalisation, admitted stroke patients are more likely to contract a hospital - acquired infection which worsen morbid condition of patients. [4]

The stroke treatments that work best are available only if the stroke is recognised and diagnosed within 3 hours of the first symptoms. Stroke patients may not be eligible for these if they don't arrive at the hospital in time. [5]

The most common presenting symptoms of ischemic stroke are speech disturbance and weakness on one - half of the body. [6]

Various diagnostic modalities have been applied to the radiological evaluation of cerebral stroke. With the introduction of Computed Tomography (CT scan) of brain a noninvasive technique has been made available to precisely demarcate the area of cerebral infarction/haemorrhage.

However, the advances of neuroimaging techniques may not always available in every health centre of resource limited country like India specially in rural and remote areas.

Act F. A. S. T concept by American stroke association [7] will help in such situation to diagnose stroke where imaging facility not available and risk factor will help to initiate precaution strategy in susceptible population.

F= Face. Ask the person to smile. Does one side of his or her face droop? A= Arms. Ask the person to raise both arms. Does one arm drift downward?
S = Speech. Ask the person to repeat a simple phrase. Is his or her speech slurred or strange?
T= Time. If you observe any of these signs refer patient to higher centre for stroke treatment as early as possible.

Objectives of the Study

1) To analyse the risk factors and clinical profile of ischemicstroke.
2) To analyse regional distribution of brain infarct based on neuroimaging (CTScan).
3) To evaluate the final out come with survival rate and proportional mortality ratio of the ischemic strokepatients.

2. Research Methodology

This is a prospective cross sectional study carried out in the department of medicine, Saraswathi institute of medical sciences Hapur. All confirmed cases of ischemic stroke admitted during February 2021 to January 2022 in medicine word were consider for the study.

Inclusion criteria
1) All patients having clinical and radiologic confirmed diagnosis of stroke were included.
2) Age of 18 years or above were include in this study
3) Diagnosis in all patients was confirmed by brain imaging study by CT scans of the brain.

Exclusion criteria
1) Head injury/trauma.
2) Transient ischemic attack (TIA) and patients having normal CT brainnormal.
3) Patients in whom CT scan could not bedone

Patients were screened for the eligibility and those fulfilling the selection criteria were briefed about the nature of the study. In case of comatose patients, the relatives/caretakers were informed about the study.

The patients/caregivers expressing their willingness to participate in the study were enrolled after obtaining a written informed consent. Patients were interviewed for their symptoms and demographic data like gender and age were noted.

History of co - morbid conditions such as hypertension, diabetes mellitus, dyslipidemia, personal history such as habits of alcohol consumption and smoking were noted.
- Hypertension, defined as systolic pressure ≥130 mmHg or diastolic pressure ≥80 mmHg or the use of anti - hypertensive medication
- Diabetes mellitus (DM), defined as use of insulin or an oral hypoglycaemic agent or a fasting glucose value ≥126mg/dL

All cases were followed up till the hospital stay to assess outcomes and mortality.

3. Results

During 1 year of study total 49 confirmed cases of Ischemic stroke was enrolled in the study. Most of the patients were aged between 61 to 70 years (29%) and the mean age was 63.03 ± 9.83 years. Majority of the patients (55%) were males and the male: female ratio was 1.22: 1.

Table 1: Characteristics of stroke patients

Gender	Frequency (%) (n=49)
Male	27 (55%)
Female	22 (45%)
Age range in years	29–89
Mean Age ± SD	63.03 ± 9.83
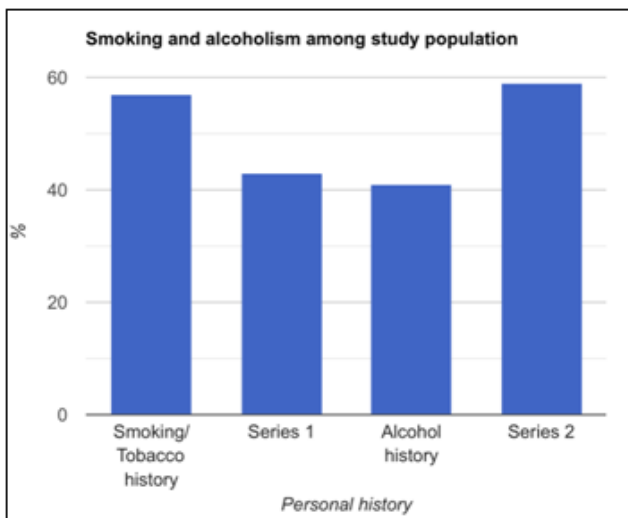
Ischemic stroke more commonly seen in male (55%) patients. Disease was prevalent among age group range from 29 to 89 years age with mean age of more than 60 years.
On asking regarding habit 57% patients were reported smoking and 41% reported alcohol habit. Smoking is more common among stroke patients compare to alcohol but due to lack of comparison group association not commentable.

Table 2: Risk Factors among the study population

Risk factors	Frequency (%)
Hypertension (HTN)	16 (32%)
Diabetes Mellitus (DM)	14 (29%)
HTN + DM	19 (39%)
S. Cholesterol (200mg/dL)	13 (26%)
S. Triglyceride (150mg/dL)	09 (19%)
HDL (<40mg/dL)	14 (29%)

Hypertension and diabetes together found in higher number (39%) followed by hypertension (32%) and diabetes (29%) alone.
Dyslipidemia also as risk factor found in study population. Low HDL level being a risk factor found in higher percentage comparable to lipid profile.

Table 3: Presenting symptoms among the study population

Symptoms	Frequency (%)
Headache	06 (12%)
Vomiting	05 (10%)
Limb/motor weakness	41 (84%)
Altered sensorium	18 (37%)
Speech disturbance	21 (43%)
Vertigo	09 (18%)

Majority of study participants were presented with weakness in limb (84%) followed by speech disturbance (43%), Altered sensorium (37%), convulsion (35%). Vertigo, headache and vomiting seen in less than 1/5th of patients.

**Table 4:** Motor weakness among the study population

Limb involvement	Frequency (%)
Hemiplegia	35 (72%)
Bilateral	05 (10%)
Monoplegia	01 (02%)
No motor weakness	08 (16%)
Total	49 (100%)

Table 5: Affected areas of brain on CT scan

Area	Frequency (%)
Pons	09 (18%)
Thalamus	07 (14%)
Basal ganglia	10 (20%)
Para ventricular	05 (10%)
Cerebellar	03 (06%)
Frontal	15 (31%)
Parietal	16 (16%)
Temporal	10 (10%)
Occipital	08 (16%)

According to study finding seven out of ten patients presented with hemiplegia. Not all ischemic stroke patients presented with weakness in limb as in study 16% did not reported weakness. In present study parietal region of brain

is more commonly affected by ischemic stroke followed by frontal region. Temporal region and basal ganglion involvement equally seen in 20% of patient. Pons, occipital, thalamus, para ventricular and cerebellar was reported in less than 20% of patients.
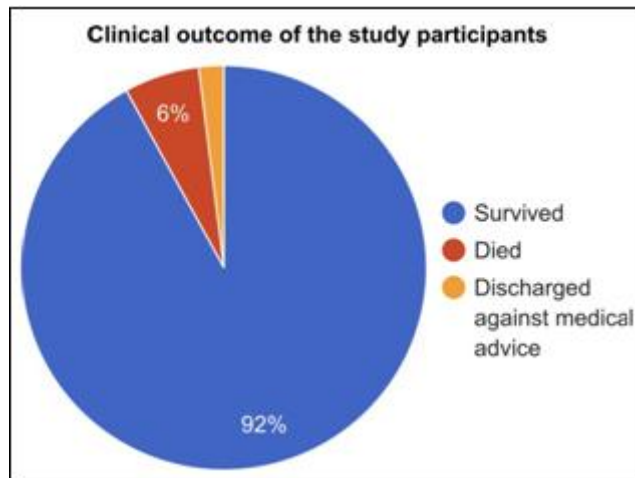
On observation of outcome of ischemic stroke patients, study found favourable end result among admitted ischemic stroke patients with 92% of survival rate. Proportional case mortality ratio was calculated among study population was 6%.

4. Conclusion & Recommendations

Present study found risk factor similar to existing literature regarding acute ischemic stroke.

High proportion of the patient reported with smoking and alcohol which is modifiable risk factor to prevent stroke.
Co - morbidity like hypertension, dislipidemia and diabetes is well known for the stroke need to be well manage in their early stage to prevent stroke.

Though the outcome in present study was quite good, need to prevent disease occurrence to decrease burden of disease itself.

Limitation of study was small number of patients which can overcome by enrolling large number of population in study research.

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